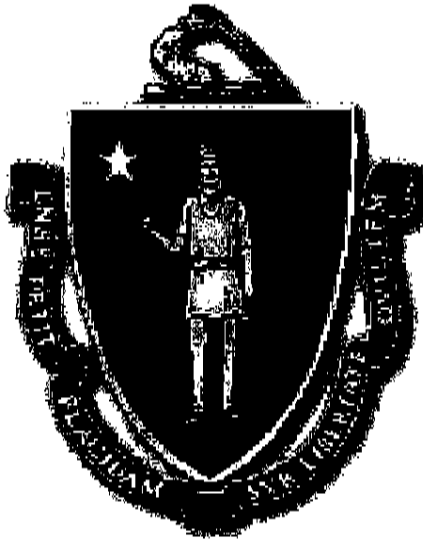


Commonwealth of
Massachusetts
Department of Public Safety
ACCIDENT REPORT



October 28, 2004

JARO Amusements, Shrewsbury, MA
Sizzler Amusement Accident

Investigating Inspectors

Thomas G. Gatzunis, Commissioner
Mark F. Mooney, Assistant Chief of Inspections

ACCIDENT / INCIDENT FACT SHEET

DATE AND TIME: September 19, 2004, 1430 hours

LOCATION: St. Mary's Church
646 Main Street
Shrewsbury, MA

INJURED/DEAD: [REDACTED]
[REDACTED]
[REDACTED]

OBJECT UNDER INVESTIGATION: Sizzler Amusement Ride

MANUFACTURER: Wisdom Manufacturing Company
Sterling, CO 80751

Owner/Operator: JARO Amusements Inc.
Carlisle, Ma. 01741

INSPECTORS: Mark F. Mooney (lead inspector)
Thomas G. Gatzunis

LOCAL INVESTIGATING POLICE: Det. Paul Brown, Shrewsbury Police Dept.
Det. Paul Dunkin, Shrewsbury Police Dept.
Det. Mike Cappucci, Shrewsbury Police Dept.

STATE INVESTIGATING POLICE: Cpt. Tom Greene, Massachusetts State Police
Sgt. Steve Kelly, Massachusetts State Police
Trooper Tom Poirier, Massachusetts State Police

INCIDENT SUMMARY

On the above date and location, at approximately 1430 hours, as the Sizzler amusement ride was in operation, car #6 catastrophically failed at approximately 160 ° from the operator control panel. Two patrons, [REDACTED] and [REDACTED] were ejected from the ride. As a result of the ejection, [REDACTED] struck the pavement sustaining serious injuries, and [REDACTED] struck the ride platform sustaining fatal injuries. A third rider [REDACTED] was also injured. She was treated at the hospital and released later that same day.

ACCIDENT INVESTIGATION

BACKGROUND

On September 19, 2004 at approximately 1430 hours, a Sizzler amusement ride accident occurred at St. Mary's Church, 646 Main Street, Shrewsbury, Massachusetts. The ride was manufactured by Wisdom Manufacturing Company of Merino, Colorado (See photos # 9 & 10) and owned by Jaro Amusements Incorporated of Carlisle, Massachusetts. Within a half hour of the incident, the Shrewsbury Police Department contacted the Massachusetts State Police who in turn contacted the Department of Public Safety. Local and State Police secured the scene and started a preliminary investigation. Thomas G. Gatzunis, Commissioner of Public Safety, arrived on the scene at 1530 hours and Mark F. Mooney, Assistant Chief of Inspections of the Massachusetts Department of Public Safety arrived at 1630 hours to assist in the investigation pursuant to Massachusetts General Laws Chapter 140, Section 205A. The victims of the accident, [REDACTED], [REDACTED] and [REDACTED] were given medical treatment on the scene and transported to local hospitals. [REDACTED] was later pronounced dead at UMass Memorial Center in Worcester, Massachusetts.

FACTUAL FINDINGS

Based on witness statements, photographs and inspector observations, Department of Public Safety Inspectors make the following Findings of Fact:

The victims, [REDACTED] and [REDACTED] were riding in car #6 on the Sizzler amusement ride when the car catastrophically failed.

Inspectors observed that all car lap restraints were secured with 5/8" bolts and lock nuts, as required by the manufacturer, except for the inside bolt on car #6. This bolt did not have any nut attached to

Information contained within this report was obtained as a result of a joint investigation conducted by the

it immediately following the failure (See photos # 4, 5, 6, 7 & 8). A 5/8" nut was observed in the failed car (See photo # 11). This type of nut does not comply with the manufacturer's requirements. The nut securing the 5/8" bolt supporting the inside lap restraint backed itself off prior to the catastrophic failure.

The manufacturer requires the cars be secured to the sweep with four (4) 7/16" grade 5 bolts screwed into tapped holes in the sweep. A close observation of the rear tapped hole on the sweep for the outside panel revealed deformation consistent with excessive horizontal force (See photo # 14). A sheared 3/8" bolt and nut was found in the area consistent with the angle of projected failure. The damage was consistent with the undersized bolt used to secure the side panel (See photo # 3). Additionally, the channel iron which creates the side panel demonstrated slight deformation at the bolt hole identical with the 3/8" bolt head.

Observation of the bolt remaining in the front hole on the sweep for the outside panel showed no substantial signs of excessive force. It was noted, however, that the head of that bolt was missing. (See photos # 12 & 13). Further testing and analysis is required in order to determine exactly how and when the bolt head was removed. A determination as to whether the bolt head was intentionally removed or if it failed due to lamination, over tightening, or some other manufacturing defect is within the scope of the District Attorney's investigation.

Failure to have the proper lock nut on the 5/8" lap restraint bolt enabled the nut to gradually work itself off the bolt each time the lap restraint was moved into position. As the nut worked itself loose, this created some misalignment of the lap restraint that would make it difficult to move the lap bar

into proper position. Witnesses who rode the ride in the days prior to the incident indicated difficulty moving the restraint into position and in some cases moved to another car as a result of the difficulty moving the restraint.

Department of Public Safety Inspectors requested both maintenance logs and ride operator logs. They were informed by Brian McCullough, the maintenance manager, and owner Jack Keough that there were no ride maintenance logs because no maintenance had been performed. Mr. Keough did produce the ride operator logs.

The Sizzler Operators Manual instructs the owner/operator to perform various maintenance procedures on the ride. Specifically, the owner/operator is instructed to:

- Daily check that the foot tub hinge bolts are secure (see page 19)
- Daily raise lap bar and check lap bar hinge bolts and ear for wear (see page 19)
- Lubricate various components at various times (see pages 20, 21)
- Weekly check each hinge bolt and nut, and to replace all loose nuts with new lock nuts (see pages 24, 25)
- Annually inspect the car body and frame assembly mounting bolts for loose or missing bolts and to replace as needed (see pages 22, 23, 25)

The annual report from the 3rd party insurance inspector indicated that the ride was in accordance with the manufacturer's specification at that time (March 2004).

In August of 1994, Wisdom Manufacturing Company sent a Required Inspection Notice (see page 25) to all Sizzler Ride Owners. A copy of the bulletin was found in the owner's manual supplied to the investigators by Jaro Amusements. This notice contained specific references, recommendations and procedures regarding the seat mounting bolts.

In May of 1997, Wisdom Manufacturing Company sent out a bulletin regarding the Sizzler foot tub.

This bulletin required daily inspections of the pivot hole on each foot tub. This bulletin was also found in the owner's manual supplied to the investigators by Jaro.

These bulletins indicate that the manufacturer was aware of the potential problems with the attachment of the cars and the safety restraint system of the cars on the Sizzler Rides (see page 26 through 30). The Manufacturer provided this information to the owners/operators. Jack Keough, owner of Jaro Amusements, admitted to Investigators Gatzunis and Mooney that no maintenance was performed on this ride. Jaro Amusements also failed to produce any maintenance reports upon request by Assistant Chief Mooney. Therefore, Jaro Amusements was unable to provide proof that the required maintenance and inspections contained within the bulletins had been performed.

It is also noted that Jaro Amusements provided an itinerary that informed the Department that Jaro Amusements was scheduled to arrive at St. Mary's Church in Shrewsbury on September 19th and be in operation from September 23rd to the 25th, the following week. Jaro Amusements was set up and running the amusement device a week earlier. Jaro Amusements failed to notify the Department of any change in itinerary or to submit a revised itinerary. Jaro Amusements' operation of the ride on dates other than those listed in the itinerary filed with the Department is a violation of Massachusetts General Laws, Chapter 140, Section 205A.

CONCLUSIONS

Department of Public Safety Inspectors concluded that the 5/8" standard nut twisted off the bolt and dropped into the inside of the car prior to the catastrophic event. With two adults in the car, having a combined weight of approximately 350 pounds, and the lap restraint no longer secured to the outer side panel or to the rest of the car, the full weight and force of the patrons in the ride was applied to the outer side panel. As the force increased, the panel began to tilt under the excessive stress. Since the front outside panel bolt head was missing, the panel rotated off the remaining front bolt stud leaving the entire force on the single undersized 3/8" bolt located on the rear outside panel. This bolt then yielded under the force resulting in the patrons being ejected from the ride.

Based on this investigation, the Department has identified the following primary **contributing factors**:

1. **Improper replacement of nut on the inside 5/8" lap restraint bolt.** The manufacturer requires that the 5/8" bolt be secured with a lock nut. The lock nut was replaced with a standard nut. Failure to use a lock nut enabled the nut to rotate off the lap restraint / foot carriage bolt.
2. **Improper replacement of the nut and bolt on the rear outside panel that secures the panel to the secondary sweep.** The manufacturer requires the outside panel be secured to the secondary sweep using two (2) 7/16" grade 5 bolts into a tapped hole in the secondary sweep. The rear 7/16" bolt was replaced with a smaller 3/8" bolt and nut through the same hole. This undersized bolt and nut could not withstand the stress forces exerted upon it.
3. **Altered bolt on the front outside panel that secures the panel to the secondary sweep.** As stated in #2, the manufacturer requires the outside panel to be secured to the secondary sweep using two (2) 7/16" grade 5 bolts. The front 7/16" bolt head was missing. The remaining bolt stud was flush with the channel iron used to create the side panel which was attached to the sweep. The remaining stud could not withstand the stress forces exerted upon it.

Other contributing factors and significant conclusions include:

1. **Improper Maintenance Procedures.** The manufacturer requires that various maintenance procedures including; lubrication, inspection, repair and replacement of worn or broken parts be performed at various intervals throughout the season. Maintenance records are required to be available to the inspector in accordance with 520 CMR 5.03(2).
2. **Improper Notification of Itinerary.** The Department of Public Safety was not notified in accordance with Massachusetts General Laws Chapter 140, Section 205A as well as 520 CMR 5.05(2). Jaro Amusements indicated the incorrect date on their itinerary they provided.

PHOTO LOG

Location: St. Mary's Church, Shrewsbury Date: September 19, 2004

Investigating Inspector: Thomas Gatzunis / Mark Mooney

Photo Number	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

Photo Log Sketch

Photo #1 – [REDACTED]

Photo #2 – [REDACTED]

Photo #3 – [REDACTED]

Photo #4 – [REDACTED]

Photo #5 – [REDACTED]

Photo #6 – [REDACTED]

Photo #7 – [REDACTED]

Photo #8 – [REDACTED]

Photo #9 – [REDACTED]

Photo #10 – [REDACTED]

Photo #11 – [REDACTED]

Photo #12 – [REDACTED]

Photo #13 – [REDACTED]

Photo #14 – [REDACTED]

Photo #15 – [REDACTED]

Photo #16 – [REDACTED]

SUPPLEMENTAL INVESTIGATION DOCUMENTATION

SIZZLER DAILY CHECK LIST

1. Check for loose or missing bolts or nuts.
2. Check seat locks for proper operation.
3. Check seat lock pins for smooth operation and do not stick.
4. Check seat locks for cracks or excessive wear.
5. Check seat lock brass for excessive wear.
6. Check spindle shaft end nuts are snug and locking bolts are tight.
7. Check that seat turnbuckles are snug & jam nut is tight.
8. Lubrication schedule has been completed.
9. Check center for cracks.
10. Check drive tires.
11. Check foot tub hinge bolts are secure.
12. Check foot tub hinge plates for excessive wear.
13. Check that each seat body is not loose on the sweep.

SIZZLER

LAP BAR & SEAT LOCK INSPECTION PROCEDURE

1. Raise lap bar.
2. Check lap bar hinge bolts and ear for wear.
3. Check lap bar arm for cracks.
4. Check that seat lock brass is tight.
5. Open lap bar.
6. Push seat lock pin. It must snap back out and not drag or catch.
7. Close lap bar. Seat lock pin must snap into the notch in the brass.
3/8" minimum engagement of pin in brass.
8. Activate electric unlocking system.
NOTE: All seat locks should release.
9. Turn off electric unlocking system.
NOTE: The timer will shut off the solenoids after about 15 seconds.
10. Go around seat to inside and pull on the lap bar sideways and out to try to pop seat lock pin out of the brass.
11. If bar comes open, tie off that car until repairs are made. Replace any components needed if the bar will come open.
12. Repeat for each seat.

****WARNING****

Never install a bolt or knob to manually unlock the lapbar. Passengers have been known to open the bar while the ride is running and come out of the seat.

****DANGER****

Each seat lock pin is custom drilled for each car and lap bar. Make sure the same pin goes back to the same bar on the same car.

LAP BAR LUBRICATION

Weekly

- Oil all hinge bolts.
- Oil seat lock pin

Monthly

- Remove pin.
 - Clean pin and pipe.
 - Oil pin and reassemble.
 - Make sure pin moves smoothly in and out.
 - Perform above inspection before operating ride.

SIZZLER LUBRICATION SCHEDULE

CENTER POLE

Lower Main Center Bearing
4 shots of grease one zerk weekly

Middle Center Pole Bearing
4 shots of grease one zerk weekly

Upper Commutator Bearing
1 shot of grease monthly

Hydraulic Oil
Check daily, repair leaks as needed, fill with Mobil DTE24 summer grade hydraulic oil or equivalent

SPINDLES

Top & Bottom Spindle bearings
1 shot grease each bearing monthly

Spindle Shaft
Lightly grease to prevent rusting

Chain Fall
Follow manufacturer's recommendations

SEATS

Seat Foot Tub and Lap Bar Hinge Bolts
Light machine oil weekly

Seat Lock Pin
Light machine oil weekly, remove and clean on monthly basis

CENTER POLE

Upper Sweep Hinge Bolts
Light machine oil prior to tear down, 4 bolts

Removable Sweep Pins
Grease prior to installation-thin film, 4 pins

Stand Up Light Hinge Pipes and Shaft
Light machine or penetrating oil weekly

SIZZLER INSPECTION & MAINTENANCE RECOMMENDATIONS

DAILY INSPECTION

Perform the inspections listed on the daily check list that is included in the operator manual.

ANNUAL INSPECTION

1. Inspect car body and frame assembly mounting bolts for loose or missing bolts. Four each car. Inspect all bolts for excessive wear and replace as needed. Inspect car frame for cracks.
2. Inspect handlebar assembly for excessive wear and damage. Inspect locking mechanism for pin or hole wear. Replace or repair as needed.
3. Inspect the condition of the fiberglass foot tub for cracking, particularly around the pivot holes. Replace any internal pivot plates that are excessively worn or cracked.
4. Inspect the drive assembly for cracks.
5. Inspect sweep mounting ears for cracks and wear. Should there be excessive hole wear, holes shall be drilled out to accommodate an oversized pin.
6. All welds shall be inspected by a qualified welding inspector. We recommend a A.W.S. Certified Welding Inspector or equivalent. Visual inspection is sufficient unless defects indicate further testing is needed.
7. Main bearing. Excessive wear in the bearing may be checked by moving the sweeps up and down. Excessive play indicates bearing wear. Adjust top bearing nut to reduce play.
8. Electrical System shall be inspected by a qualified electrician for loose connections, frayed wires, amperage draw-empty and loaded, and all control functions.
9. Ride shall be reassembled and all operations shall be checked both empty and loaded before returning to operation.

Any problems or defects that are found should be reported to the factory, Wisdom Industries, LTD., P.O. Box 5000, Sterling, Co. 80751. Phone: 970-522-7515.

SEAT INSPECTION CHECKLIST

SEAT LOCK BRASS

CHECK FOR WEAR AND LOOSENESS.

CHECK SEAT LOCK PIN FOR

$\frac{3}{8}$ " - $\frac{1}{2}$ " ENGAGEMENT IN BRASS.

LIGHT OIL SEAT LOCK PIN WEEKLY.

CHECK THAT SEAT LOCK PIN

DOES NOT STICK AND

MOVES SMOOTHLY

CHECK SEAT LOCK PIN

SET SCREW IS

INSTALLED $\frac{1}{8}$ " MAX

STICK OUT.

DO NOT USE

BOLT

DO NOT INSTALL KNOB.

SEAT LINER

CHECK FOR CRACKS AND LOOSE FASTENERS

CAR BODY

DAILY

CHECK FOR CRACKS AND LOOSENESS ON FRAME IF CAR BODY IS LOOSE DO NOT USE CAR UNTIL INTERNAL FRAME IS CHECKED.

SEAT

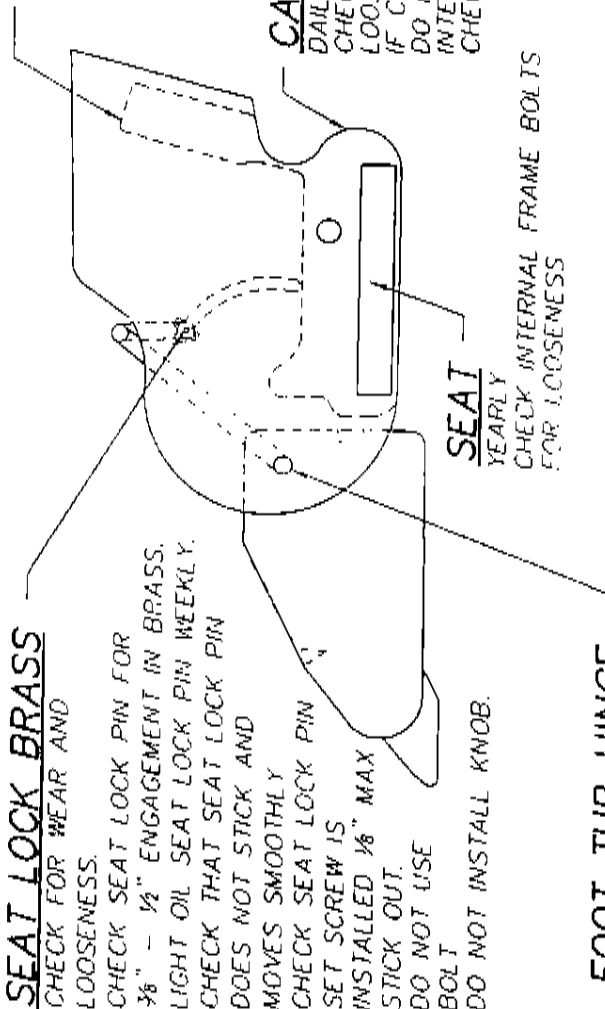
YEARLY

CHECK INTERNAL FRAME BOLTS FOR LOOSENESS

FOOT TUB HINGE

INSPECT FOR LOOSENESS.

OIL HINGE BOLT BEFORE TEAR DOWN.



 WISDOM INDUSTRIES		Merino, CO 80741	
SCALE: N.T.S.	APPROVED BY:	DRAWN BY: MJC	REVISED:
DATE: 03-05-97	DESCRIPTION:		
SEAT INSPECTION CHECKLIST			
EQUIPMENT		DRAWING NUMBER	
SIZZLER		3S-04	

MAR 05, 1997 - 08 41 06 < C:\922-DWG\3S-04 >

MECHANICAL

BROKEN ROLLER BEARINGS.

The roller bearing outer race can break and drag on the spindle pipe as the seats are raised for moving down the road. Repair calls for replacement of the bearing and adjustment of the eccentric nut to push the sweep about an eighth of an inch away from the spindle pipe. The cause of the bearing breaking is due to slack in the adjustment bolt that holds the sweep snugly against the spindle pipe. Adjust these bolts each time the ride is moved.

SEAT NOSE PLUGS POP OUT.

The reason for the chromed hole plugs popping out is normally vibration. The other reason is, the bolt that the nose hinges on has loosened. Tighten the bolts as soon as possible. The bolts can work out and let the nose drop down causing a great deal of damage during operation of the ride.

GREASING THE RIDE.

There are three places to be greased on the center pole. One in the top bearing under the top weather protector plate, one halfway down the center-pole next to the side cover plate, and one at the base of the center-pole next to the pressure relief valve. The top bearing should be greased with one shot of grease every other week, and the other two should get a few shots every week.

All pillow block bearings at each end of the spindle shafts, should get one shot every other week. These are sealed bearings and do not need to be filled with grease.

HINGE BOLTS

Oil the hinge bolts on the nose of the Sizzler seats. This will prevent rust from building up and also after the ride has been moved from winter storage, will prevent the nose tip from being frozen into position and possibly causing the hinge bolt to be sheared off when the nose is forced down into the operating position.

Check each hinge bolt and nut weekly. If the nut is loose replace as soon as possible with a new lock nut.

REPLACEMENT OF BOLTS

During normal maintenance practices, it is necessary to replace some bolts. They work loose because they have not been checked periodically, or they become lost when they are removed to repair some component. The points we wish to stress are the following:

WMI Industries, Inc. uses only grade 5 bolts or better.

Bolts are identified by markings on the bolt head. Bolts without markings are generally grade 2 or 3 (common hardware store variety) and are not strong enough to be used on amusement rides in high stress areas.

When replacing any bolt, always use an equivalent or stronger bolt. Higher numbers mean stronger bolts.

NOTE: There are some bolts available above grade 8; however, these bolts are not to be used for general purposes. They are extremely brittle and are designed for special applications.

If trouble is encountered with bolts working loose, check the tightness according to the torque chart.

If certain bolts continue to work loose, remove the bolts and inspect the threaded holes. If threads are in good condition, clean the hole out with a non-oil base solvent and blow dry and apply "loctite" to the threads. After doing this, install new washer and bolt and torque as per the chart.